MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2018 / 2019

PPS 0335 – PROBLEM SOLVING AND PROGRAMMING

(Foundation in Information Technology)

2 MARCH 2019
2.30p.m. – 4.30p.m.
(2 Hours)

INSTRUCTIONS TO STUDENT

1. This question paper consists of 4 pages (excluding the cover page) with 5 questions only.

2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please write all your answers in the Answer Booklet provided.

QUESTION 1 [10 Marks]

a. In computing term, what is the meaning of programming?

(1 mark)

b. One of the important steps before programming is to develop an algorithm. Why is this step important?

(2 marks)

c. Before a program can be executed, we need to compile the program beforehand. Briefly explain the compilation process.

(2 marks)

d. Prior to programming steps which refers to Question 1a, 1b and 1c, a programmer must have a problem-solving skill first. The skill that the programmer needs when encounters a problem. Based on our discussion in class, there are six-steps for an effective problem-solving process. State the **SIX (6)** steps.

(3 marks)

e. A typical example of problem that uses heuristic approach or solution is a chess game program. Discuss briefly why is it so?

(2 marks)

QUESTION 2 [10 Marks]

a. Explain why the following variables are called illegal variables.

i. number of cakes
ii. 1number
iii. discount%
iv. int
v. 1234
vi. product-name

(3 marks)

b. Convert the following phrases to computer expressions. Let ***n*** represent the number.

i. Add nine to a number
ii. The difference between forty-six and a number
iii. The sum of a number and twenty-six
iv. Fourteen times a number
v. The quotient of twenty and a number
vi. Half of a number

(3 marks)

c. Write the following sentences as computer equations. Use the suggested variables (the letter in **bold** and *italic*) in your equations.

i. A vehicle rental company charges RM100 to rent a moving truck plus RM2.50 for each kilometer traveled. What is the total cost of renting a truck and driving ***X*** kilometers?
ii. The perimeter of a square is 20 centimeter. What is the length, ***S***, of a side of the square?

Continued ...

iii. John has an orthodontist's appointment to get his braces checked every 6 weeks. About how many times, T, does he have to go to the orthodontist in 4 years?

iv. You deposit RM30 into your savings account, and your new balance is RM100. What was your previous balance, B?

(4 marks)

QUESTION 3 [10 Marks]

a. Ralph is a salesman. He receives a salary of RM45,000 per year. His company plans to give out bonuses of up to RM1,000 to its workers. However, the amount of bonus each worker receives will depend on his or her time with the company. Here is a breakdown of what the workers should expect to receive:

20 years or more of service: RM1,000
15 to 19 years of service: RM750
10 to 14 years of service: RM400
5 to 9 years of service: RM300
2 to 4 years of service: RM250
Less than 2 years of service: RM200

Develop a problem analysis chart (PAC) to determine Ralph's monthly salary and gross salary of that year. Use straight-through logic for the decision.

(4 marks)

b. Refer to Question 3(a); convert the decision part to negative logic structure.

(3 marks)

c. Develop an input-processing-output (IPO) chart to determine the cost of a ticket to a cinema, based on the customer's age. Assume that the cost of a full-price ticket is RM10. The detail of the ticket's price is shown in **Table 1**.

Table 1

Age	Price
Under 5	Free
5 to 17	Half price
18 to 55	Full price
Over 55	RM2 off

(3 marks)

Continued ...

QUESTION 4 [10 Marks]

a. A company plans to conduct a survey to find out the customer satisfaction towards its product. About 150 respondents will participate in the survey. **Table 2** shows the detail of the survey's input and output required.

Table 2

Satisfactory level	Satisfactory Description	No of respondents	Percentage
1	Very Good		
2	Good		
3	Moderate		
4	Bad		
5	Very Bad		

Develop an algorithm to solve the problem. The algorithm will:
- read the satisfactory level: 1, 2, 3, 4 or 5
- repeat the previous step until all 150 respondents' data are read
- while repeating the previous step, calculate total number of respondents for each level
- then, calculate percentage of each level
- print the percentage and satisfactory description for each level

(6 marks)

b. Change the following pseudocode to flowchart.

```
start:
    total = 0
    loop: counter = 1 to 50 step 1
        read height
        if (height >= 150)
            total = total + 1
        endif
    loop-end: counter
end:
```

(4 marks)

QUESTION 5 [10 Marks]

a. The following pseudocode is to find an area of a room. Write a function ***FindArea()*** to calculate and return the area of the room.

```
Start:
    Read width
    Read length
    Area = FindArea(width, length)
    Print Area
End:
```

(2 marks)

Continued ...

b. Convert the following flowchart; refer to **Figure 1**, to algorithm.

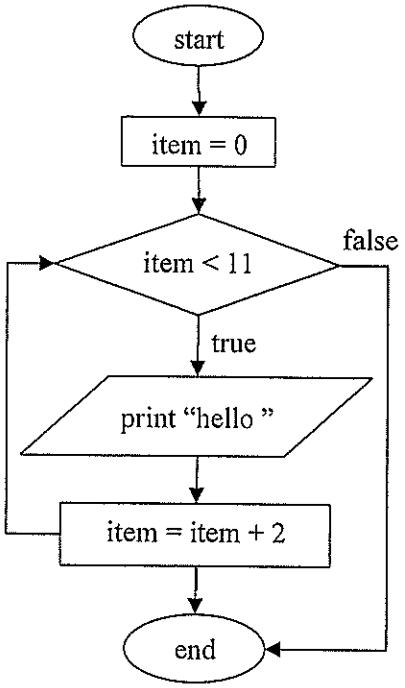

Figure 1

(2 marks)

c. What is the output of Question 5 (b)?

(1 mark)

d. A friend of yours has gotten a new credit card with a credit limit up to 10, 000 ringgit. To attract customers, the card offers 3 points for every ringgit purchased and a bonus of 30 ringgit with a minimum spend of 1000 ringgit in a single purchase.

Develop a pseudocode which does the following:

- ask the user to enter the credit limit. You must make sure that the user enters a positive number and not more than 10,000. If they do not enter a positive number and more than 10,000, print a message informing them so
- then repeatedly ask the user to enter the amount of every purchase made. The process (loop) will automatically stop when the user enters 0 or the total purchase meets the credit limit
- finally, the flowchart should print the total purchase, total points collected and total bonus earned

Sample output is given below to help you design the pseudocode.

```
Enter credit limit: -1500
Must be positive number and not more than 10,000
Enter credit limit: 15000
Must be positive number and not more than 10,000
Enter credit limit: 10000
Purchase amount: 500
Credit limit balance is 9500
Purchase amount: 900
Credit limit balance is 8600
Purchase amount: 2000
Credit limit balance is 6600
Purchase amount: 1500
Credit limit balance is 5100
Purchase amount: 5000
Credit limit balance is 100
Purchase amount: 0
Credit limit balance is 100

Total purchase: 9900
Total point collected: 29700
Total bonus earned: 90
```

(5 marks)

End of Paper